would be fairly large and potentially unmanageable. Transplantation of scallops from areas of high densities to small areas may be more manageable. Additionally, this approach would provide a better chance for successful fertilization when the scallops spawn. Transplantation of scallops with low-density broadcasting without fencing may decrease chances of successful fertilization.

The development of a commercial fishery for cownose rays is another option that may be considered in addressing the predation problem. However, in order to develop a profitable fishery, there must first be a market. Possible markets may include the bait industry, food industry (pet and human), the supplement industry (pet and human), and the fertilizer industry. There were experiments in the 1970s on the use of cownose ray wings as bait in the crab pot industry in Virginia. Compared to menhaden as bait, the ray wings lasted longer and caught as many crabs as menhaden bait (J. Smith NOAA, NMFS Beaufort Laboratory, personal communication 2006). The food industry may benefit from cownose rays as both a protein source and a supplement source of chondroitin sulfate, glucosamine, and oil. For any ingredient to be pursued by a pet food manufacturer consistency of supply is crucial and ingredients that may vary by season are not often of interest. Pet food is the most highly regulated food product in the world; so stable inputs of quality ingredients are needed year round (N. Cook, Pet Food Institute, personal communication 2006). Another concern would be if cownose rays would fit any of the current feed ingredient definitions used by the NC Department of Agriculture (S. Jordan, NC Department of Agriculture, personal communication 2006).

Recently, Virginia has made an effort to address the use of cownose rays as human food. The Virginia Marine Products Board (VMPB) has begun pursuing the possibility of a commercial fishery for the cownose ray and markets in South Korea. The VMPB recently dispatched a trade mission to South Korea to determine whether cownose rays could be marketed in that country (S. Estes Virginia Marine Products Board, personal communication 2006). In the meantime, according to Scott Harper with the Virginian-Pilot (December 30, 2005), local appetites were tested at the Hampton Bay Days festival where the VMPB barbecued the ray wings and labeled them as "Chesapeake rays".

A proactive management plan for cownose rays would need to be implemented if a fishery was developed. This plan would need to establish management strategies such as quotas, seasons, size limits, trip limits, etc. to prevent overfishing and allow for adequate recruitment. Cownose rays, like other elasmobranches are most likely vulnerable to overfishing because they are slow to mature and have low fecundity. Establishing a recreational fishery through fishing tournaments and derbies for sport fishermen as well as adding the cownose ray to the list of citable fish is another option to consider. However, a proactive management plan would still be required.